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ABSTRACT

This study compared mother-child interactions and investigated how child verbal abilities interact with age to influence maternal scaffolding (teaching) styles in a group of 60 mother-child dyads in which the children were aged 3, 4, and 5 years (20 dyads in each of the 3, 4, and 5 year age groups). The mother-child pairs were filmed completing a model grocery store task in which they searched for 3 specific items. The children's verbal IQ was also measured, and the mothers filled out a questionnaire on parent-child interactions. Results indicated that there was a decrease with age in the proportion of maternal statements related to task-specific materials, particularly between the ages of 3 and 4. Mothers of 4-year-old children used proportionately more metacognitive statements, while mothers of 3-year-old children used proportionately fewer such statements, than did mothers of the 5-year-old group. (MDM)

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# MATERNAL ADJUSTMENT TO DEVELOPING CHILD COMPETENCIES: IS AGE ALL THAT MATTERS?

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According to Vygotsky's theory (1978; Schneuwly & Bronckart, 1985), social interactions play an important role in the development of higher mental abilities. Piaget (1967; Youniss & Damon, 1992) has also emphasized the importance of co-operation with peers in promoting cognitive development. Researchers have tried to further specify Vygotsky's and Piaget's assumptions, and many studies have been conducted to examine differences between adult- and peer-child interactions (Rogoff, 1990), as well as interindividual differences in maternal scaffolding styles (e.g. Saxe, Guberman & Gearhart, 1987). To date however, only a few studies have focused on the child's contribution to the quality of mother-child interactions. Furthermore, there has been almost no consideration of the impact of the intellectual characteristics of the participants, let alone their general developmental levels, on collaborative and learning processes. Moss (1992a,b) has discussed theoretical and empirical conceptions of the zone of proximal development with respect to infants under three years of age. However, there has been little work of this nature with reference to older children. On the basis of Bickard's model (1992) of scaffolding and self-scaffolding, we can expect that certain individual child characteristics - such as verbal abilities - affect the capacity to benefit both from mother-child and other collaborative learning contexts, thus further accentuating existing interindividual differences.

During the preschool period, metacognitive abilities (i.e. problem definition, planning, monitoring and self-evaluation) enter the zone of proximal development (Díaz, Neal & Amaya-Williams, 1990; Flavell, Speer, Green & August, 1981; Gauvain, 1992; Kopp, 1982). The first goal of this study is to compare mother-child interactions for three age groups (three-, four-, and five-year-olds) during a simple planning task adapted from Gauvain & Rogoff (1989). A second goal is to investigate how child verbal abilities interact with age to influence maternal scaffolding styles. The Gauvain & Rogoff task was chosen because it is too difficult for three- to five-year-olds to perform efficiently without maternal assistance and because metacognitive activities are needed to succeed.

## METHOD

*Subjects*

Sixty dyads composed of mothers with their preschoolers participated in this study. They were recruited from daycare centers in the Montreal area and represent an urban French-Canadian population with diverse SES characteristics. Dyads were selected from a larger sample (N = 160) to form three age groups, equivalent with respect to verbal IQ and sex composition: 20 three-year-olds (50% girls; age range: 30 to 41 months; mean PPVT verbal IQ: 109), 20 four-year-olds (50% girls; age range: 42 to 53 months; mean PPVT verbal IQ: 111), and 20 five-year-olds (50% girls; age range: 54 to 65 months; mean WPPSI verbal IQ: 118). Child verbal IQ was measured using the French version of the Peabody Picture Vocabulary Test (PPVT) or the Verbal subscale of the Weschler Preschool and Primary Scale of Intelligence (WPPSI). Since the WPPSI yields mean scores about 8 points higher than the PPVT, the five-year-old group mean verbal IQ score is assumed to be equivalent to the others.

*Task and Procedure*

Mother-child dyads were filmed completing the model grocery store task adapted from Gauvain & Rogoff (1989). The task includes four phases: 1) dyadic exploration of task material, 2) search for three items with mother available, 3) search for five items with mother available, and 4) completion of a five-item list with mother partially available (occupied with some other task). For the purpose of this communication, we will present data from the second phase only. In this phase, the task goal is to find all (and only) the items pictured on a list (supplied by the experimenter) from a model grocery store. Participants were informed of four rules governing task activity: 1) subjects must trace their route through the model grocery store using a Fisher-Price figurine; 2) they must stop the figurine in front of a located item before picking it up and putting it in a basket; 3) they must take the shortest route; and 4) they must move the figurine through a designated exit after finding all the items. Mother and child were instructed to do the task together.

Following the model grocery store task, dyads were served a light snack. This 10-minute interlude was followed by a second experimental period during which child verbal IQ was measured while the mother answered a questionnaire in another room.

*Coding of Interaction*

Observers rated mother and child metacognitive strategies, interpersonal co-ordination skills, object exploration and affective expressions from videotapes, using the Joint Problem-Solving System (Moss, Parent, Gosselin & Dumont, in press). Codes were grouped based on categories used by Freund (1990) to form a cognitive complexity level index for maternal verbal instructions (see Table 1).

## RESULTS AND DISCUSSION

In order to verify whether mothers adjusted the cognitive complexity level of their instructions as a function of child age and verbal IQ, we used log-linear analysis with maternal instructions as a dependant variable (logit-model analysis).

Verbal IQ was transformed into a categorical variable and used as an independant variable. Within each age group, subjects were divided into three subgroups: those with 1) low verbal IQ, 2) average verbal IQ, and 3) high verbal IQ. Table 2 reports the number of subjects, mean verbal IQ, and standard deviation for each group as a function of age.

A 5 (maternal instruction complexity level) X 3 (age group) X 3 (verbal IQ group) logit-model analysis was performed. Results showed a significant main effect for age and for verbal IQ, as well as a significant interaction between these variables (the residual and component likelihood-ratio chi-squares for each effect are reported in Table 3).

Examination of lambda coefficients for the age main effect indicates that there is a decrease with age in the proportion of maternal statements related to task-specific materials, particularly between the ages of 3 and 4. Furthermore, mothers of the 4-year-olds use proportionately more, while mothers of the 3-year-olds use proportionately fewer metacognitive statements than do mothers of the 5-year-old group (see Figure 1).

The verbal IQ main effect indicates that the use of statements related to task materials is more characteristic of mothers of average IQ children, and much less characteristic of mothers of high IQ children (see Figure 2).

The interaction between age and verbal IQ is illustrated in Figure 3. Three levels of maternal instructions (subgoals, task-specific strategies, and metacognitive statements) are particularly under the influence of the interaction effect. Regarding subgoals, Mary Gauvain (1992) has shown that 4-year-olds have difficulty understanding the model grocery store task structure and that an important part of maternal activity is focused on structuring the task for the child. Our results show that task structuring, or subgoal definition, represents an important part of maternal instructions for two

subgroups only: the 4-year-old average and the 5-year-old low subgroups, supporting the idea that child verbal abilities mediate the need for task structuring.

Regarding the scaffolding of metacognitive abilities, we expected to observe a developmental increase between the ages of 3 and 5, as these abilities are then entering the zone of proximal development. This pattern is observed only for mothers of the most verbally competent children. In fact, the patterns associated with the 3- to 5-year-old high subgroups reflect a reduction of mothers' emphasis on task-specific strategies, coupled with a proportional increase in general metacognitive statements, most probably planning strategies. The patterns associated with the 3- to 5-year-old average subgroups reflect almost the opposite tendency, which may be explained by a reduction of these children's need for monitoring, allowing their mothers the opportunity to introduce specific strategies. No such developmental patterns related to the scaffolding of strategy acquisition can be observed for the mothers of the least verbally competent children.

In conclusion, we would like to stress that although observed patterns of maternal instructions are consistent with previous studies showing that structured and strategic problem solving activities enter the child's zone of proximal development between the ages of three and five years, they also provide support for our hypothesis based on Bickard's model (1992) regarding the importance of language as a self-scaffolding ability in collaborative contexts. Our results show that the cognitive complexity of maternal instructions (not the linguistic complexity) varied as a function of child age and verbal abilities, supporting the idea that children's communicative competencies act as moderators of their participation in complex collaborative problem-solving and of the benefit they may derive from these social interactions.

## REFERENCES


Bickard, M.H. (1992). Scaffolding and self-scaffolding: Central aspects of development. In L.T. Winegar & J. Valsiner (Eds.), Children's development within social context, vol. 2: Research and methodology (pp. 33-52). Hillsdale, NJ: Lawrence Erlbaum.

Díaz, R.M., Neal, C.J. & Amaya-Williams, M. (1990). The social origins of self-regulation. In L.C. Moll (Ed.), Vygotsky and education: Instructional implications and applications of sociohistorical pychology (pp. 127-154). Cambridge: Cambridge University Press.

Flavell, J.H., Speer, J.R., Green, F.L. & August, D.L. (1981). The development of comprehension monitoring and knowledge about communication. Monographs of the Society for Research in Child Development, 46(5, Serial No. 192).

Freund, L.S. (1990). Maternal regulation of children's problem solving behavior and its impact on children's performance. Child Development, 61, 113-126.

Gauvain, M. (1992). Social influences on the development of planning in advance and during action. International Journal of Behavioral Development, 15 (3), 377-398.

Gauvain, M. & Rogoff, B. (1989). Collaborative problem-solving and children's planning skills. Developmental Psychology, 25, 139-151.

Kopp, C.B. (1982). Antecedents of self-regulation: A developmental perspective. Developmental Psychology, 18(2), 199-214.

Moss, E. (1992a). The socio-affective context of joint cognitive activity. In L.T. Winegar & J. Valsiner (Eds.), Children's development within social contexts, vol. 2: Research and methodology (pp. 117-154). Hillsdale, NJ: Lawrence Erlbaum.

Moss, E. (1992b). Early interactions and metacognitive development of gifted preschoolers. In P.S. Klein & A.J. Tannenbaum (Eds.), To be young and gifted (pp. 278-318). Norwood, NJ: Ablex.

Moss, E., Parent, S., Gosselin, C. & Dumont, M. (in press). Attachment and the development of metacognitive and collaborative strategies. International Journal of Educational Research.

Piaget, J. (1967). La psychologie de l'intelligence. Paris: Armand Colin.

Rogoff, B. (1990). Apprenticeship in thinking: Cognitive development in social context. New York: Oxford University Press.

Saxe, G.B., Guberman, S.R., Gearhart, M. (1987). Social processes in early number development. Monographs of the Society for Research in Child Development, 52(2, Serial No. 216).

Schneuwly, B. & Bronckart, J.P. (Eds.) (1985). Vygotsky aujourd'hui. Neuchâtel: Delachaux et Niestlé.

Vygotsky, L.S. (1978). Mind in society: The development of higher psychological processes. Cambridge, MA: Harvard University Press.

Youniss, J. & Damon, W. (1992). Social construction in Piaget's theory. In H. Beilin & P. Pufall (Eds.), Piaget's theory: Prospects and possibilities (pp. 267-286). Hillsdale, NJ: Lawrence Erlbaum.

## TABLE 1

### Cognitive complexity level index for maternal verbal instructions

*Level 1* **Task-specific materials**

Includes labeling-identification, functional cues, perceptual cues, and object qualification.

*Level 2* **Subgoals**

*Level 3* **Task specific strategies**

Includes statements concerning item visual location (advance scanning), contextual cues, specific material organization, role definition, and elaborative statements.

*Level 4* **Metacognitive statements**

Includes rule definition, planning, monitoring and evaluative statements.

*Level 5* **Other**

Includes attention-directing statements, unelaborated positive or negative feedback, affective expressions, and attributions.

## TABLE 2

**Mean verbal IQ (M) and standard deviations (SD) as a function of child age and verbal competence**

| Age group | Verbal competence subgroup | N | Verbal IQ[a] M | Verbal IQ[a] SD |
|---|---|---|---|---|
| 3-year-old | Low | 7 | 96.1 | 5.3 |
| | Average | 7 | 110.0 | 2.8 |
| | High | 6 | 123.5 | 8.0 |
| 4-year-old | Low | 7 | 97.4 | 4.6 |
| | Average | 7 | 112.3 | 3.9 |
| | High | 6 | 124.0 | 4.8 |
| 5-year-old | Low | 7 | 100.4 | 11.4 |
| | Average | 7 | 120.9 | 4.8 |
| | High | 6 | 134.2 | 3.3 |

[a] PPVT IQ score for 3- and 4-year-old groups, WPPSI Verbal IQ score for the 5-year-old group.

## TABLE 3

**Residual likelihood-ratio chi-square for each logit model and change in chi-square associated with each component (age, verbal IQ, and interaction)**

| | Residual | | | Component | | |
|---|---|---|---|---|---|---|
| Model[a] | $LRX^2$ | | df | $LRX^2$ | | df |
| Null-Logit | 143.8 | *** | 32 | | | |
| [MA] | 115.1 | *** | 24 | 28.7 | *** | 8 |
| [MA] [MV] | 82.0 | *** | 16 | 33.1 | *** | 8 |
| [MAV] | 0.0 | | 0 | 82.0 | *** | 16 |

[a] M: Maternal instruction complexity level
A: Age group
V: Verbal IQ group

*** $p < .001$

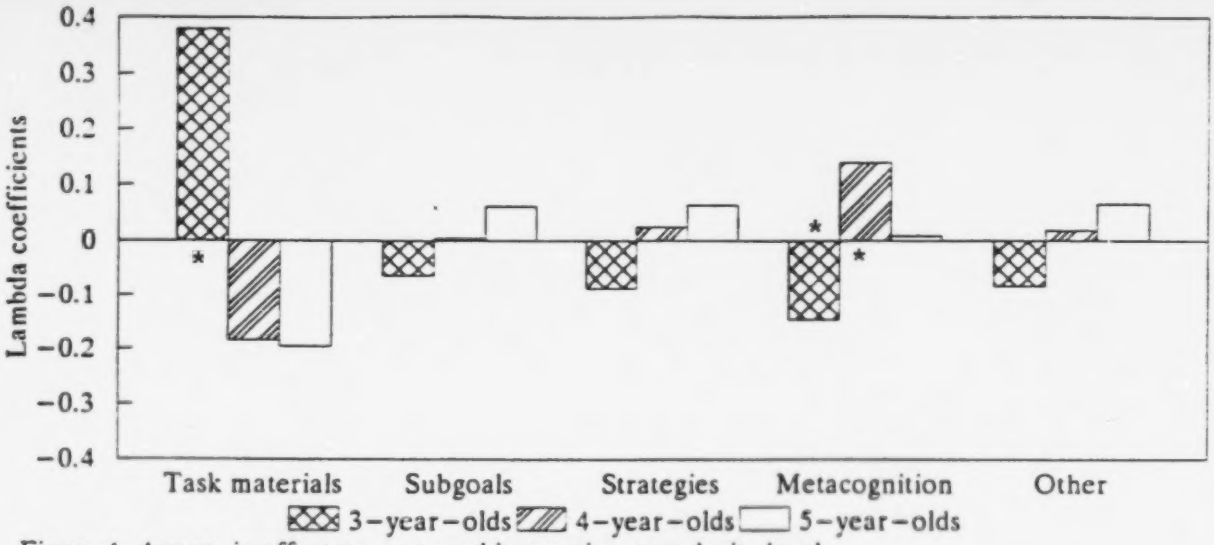


Figure 1: Age main effect on maternal instruction complexity level.

*$\underline{z} \geq 2.57$, $\underline{p} \leq .05$ analysis-wise

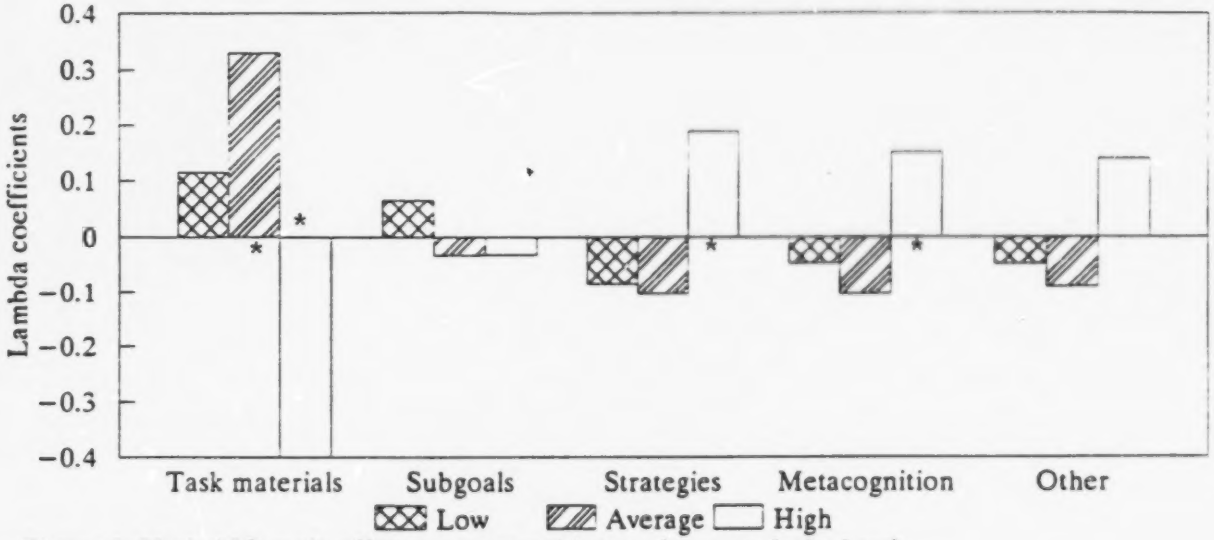


Figure 2: Verbal IQ main effect on maternal instruction complexity level.

* $\underline{z} \geq 2.57$, $\underline{p} \leq .05$ analysis-wise

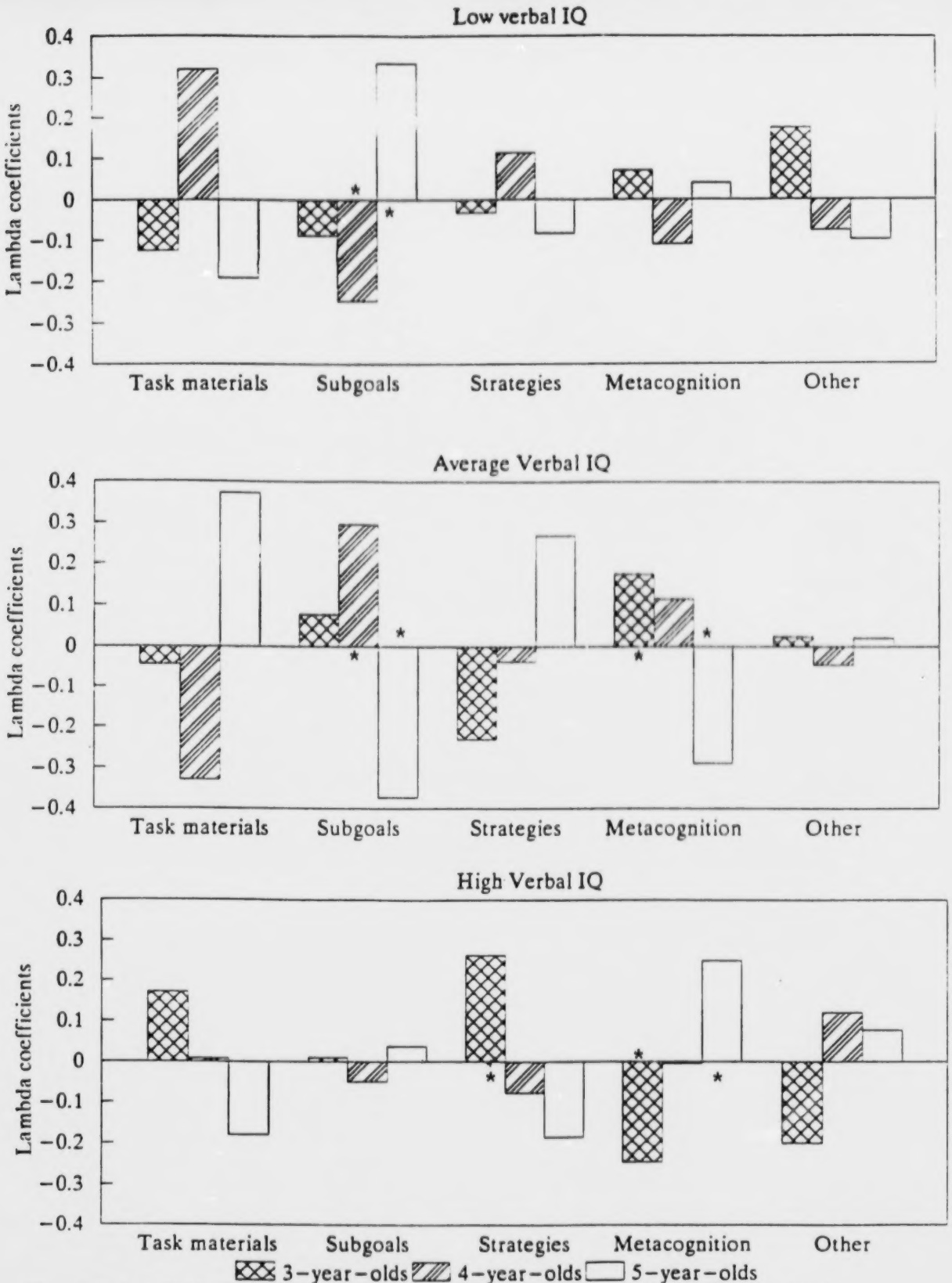


Figure 3: Age X Verbal IQ interaction effect on maternal instruction complexity level.

* $\underline{z} \geq 3.00$, $\underline{p} \leq .05$ analysis-wise